

WHAT IS CLAIMED IS:

1 1. A method for long term preservation of nucleic acid contained within
2 eukaryotic cells the method comprising:

3 i. lyophilizing an aqueous solution of intact eukaryotic cells where said
4 solution is isotonic to the cells and is nuclease free; and,

5 ii. maintaining the lyophilized cells under sealed conditions sufficient to avoid
6 contact with atmospheric humidity.

1 2. A method of claim 1 wherein the aqueous solution has been treated with
2 diethyl pyrocarbonate.

1 3. A method of claim 1 wherein the aqueous solution comprises sodium
2 chloride at a concentration of between 0.8 and 1.0% by weight to volume.

1 4. A method of claim 1 wherein the eukaryotic cells are mammalian.

1 5. A method of claim 4 wherein the cells are human.

1 6. A method of claim 1 wherein the aqueous solution comprises a standard
2 phosphate buffered saline solution.

1 7. A method of claim 1 wherein the pH of the solution is between 6.8 and
2 8.2.

1 8. A method of claim 1 wherein the cells are lymphocytes.

1 9. A method of claim 1 wherein the cells are cultured prior to lyophilization.

1 10. A method of claim 1 wherein the cells are infected with an RNA virus.

1 11. A method for isolating intact nucleic acid from lyophilized cells
2 comprising:

- 1 i. lyophilizing an aqueous solution of living eukaryotic cells where said
- 2 solution is isotonic to the cells and is nuclease free;
- 3 ii. maintaining the lyophilized cells under sealed conditions for at least 30
- 4 days;
- 5 iii. unsealing the cells;
- 6 iv. denaturing the cellular proteins to create a mixture of intact nucleic acid
- 7 and denatured cellular proteins; and,
- 8 v. isolating intact nucleic acid from the mixture of denatured cellular proteins
- 9 and nucleic acid with the proviso that the cells are not revived.

1 12. A method of claim 11 wherein the isolated nucleic acid is ribonucleic
2 acid.

1 13. A method of claim 11 wherein the cells are lymphocytes.

1 14. A collection of standardized, sealed vials containing lyophilized
2 eukaryotic cells for use as controls in diagnostic assays wherein the cells after 4 weeks at -
3 20°C have more than 50% of their 18S rRNA intact as measured by gel electrophoresis.

1 15. A sealed vial of claim 14 wherein the cells are infected with an RNA
2 virus.

1 16. A sealed vial of claim 14 wherein the cells are lymphocytes.

1 17. A sealed vial of claim 14 wherein the vial contains an inhibitor of RNase
2 in an amount effective to reduce degradation of RNA.

1 18. A nucleic acid hybridization assay kit comprising lyophilized eukaryotic
2 cells.

1 19. A kit of claim 18 wherein the cells are human.

1 20. A kit of claim 18 wherein the kit further comprises cell free nucleic acid
2 selected to hybridize to a known target nucleic acid.

1 21. A kit of claim 18 wherein the kit further comprises at least one
2 amplification primer pair.

1 22. A kit of claim 18 wherein the kit further comprises a labelled nucleic
2 acid.

1 23. A kit of claim 18 wherein the nucleic acid hybridization assay is an
2 amplification based assay.

1 24. A kit of claim 23 wherein the amplification based assay is a ligase chain
2 reaction based assay or a polymerase chain reaction based assay.

1 25. A kit of claim 18 wherein the nucleic acid hybridization assay uses RNA
2 extracted from the lyophilized cells.

1 26. A kit of claim 25 wherein the kit further comprises reverse transcriptase.

1 27. A kit of claim 25 wherein the RNA is transcribed into complementary
2 DNA during the assay.

1 28. A kit of claim 18 wherein the kit further comprises a vial containing the
2 cells wherein the vial is sealed to prevent atmospheric humidity from contacting the cells.

1 29. A kit of claim 18 wherein the cells are infected with an RNA virus.

1 30. A kit of claim 18 wherein the cells are lymphocytes.